

We Claim:

1. A wireless device comprising:

a first antenna and a second antenna; and

5 a system for determining whether or not the wireless device is either inside a building or outside a building.

2. The wireless device of claim 1 in the form of a mobile wireless device capable of accessing a wireless network.

10 3. The wireless device of claim 1 in the form of a wireless access node for providing wireless access to wireless mobile devices and also communicating with other wireless access nodes.

15 4. The wireless device of claim 1 further comprising a parameter adjuster for changing the operation of the wireless device based on whether or not the wireless device is either inside a building or outside a building;

20 wherein, upon determining that the wireless device is inside a building, the parameter adjuster switches the wireless device to a first set of radio system operation parameters; and

25 upon determining that the wireless device is outside a building, the parameter adjuster switches to a second set of radio system operation parameters.

5. The wireless device of claim 4, wherein the parameter adjuster switches the wireless device to a third

set of radio system operation parameters upon failing to adequately determine whether or not the wireless device is either inside or outside a building.

6. The wireless device of claim 4, wherein the  
5 parameter adjuster switches the wireless device to a more restrictive one of the first and second set of radio system operation parameters upon failing to adequately determine whether or not the wireless device is either inside or outside a building.

10 7. The wireless device of claim 1, further comprising first and second radio modules to which the respective first and second antennas are coupled.

8. The wireless device of claim 7 wherein the first antenna is a transit link antenna and the second antenna is  
15 an access link antenna, and the first radio module is a transit link radio and the second radio module is an access link radio.

9. The wireless device of claim 1 further comprising a test signal generator operable to transmit a test signal  
20 from the first antenna into the environment surrounding the wireless device and a received test signal analyzer operable to analyze direct and/or reflected components of the test signal from the environment surrounding the wireless device through the second antenna so as to derive at least one  
25 radio signal propagation characteristic for use in determining whether or not the wireless device is either inside a building or outside a building.

10. The wireless device of claim 9, wherein each at least one radio signal propagation characteristic is  
30 selected from a group consisting of delay spread, delay

speed, delay distance, attenuation profile, amplitude slope, polarization, and Doppler shift.

11. The wireless device of claim 4, wherein the parameter adjuster operates automatically in response to a 5 determination of whether or not the wireless device is either inside a building or outside a building.

12. The wireless device of claim 1 wherein the system for determining whether or not the wireless device is either inside a building or outside a building executes 10 automatically upon power-up of the wireless device.

13. The wireless device of claim 7 operable to, prior to making a location determination, configure the first and second radio modules to operate with a common air interface.

14. The wireless device of claim 13 wherein the first 15 radio module operates nominally according to 802.11a, the second radio module operates nominally according to 802.11b, and wherein configuring the first and second radio modules to operate with a common air interface comprises configuring them both to operate according to only one of 802.11a and 20 802.11b.

15. A method of assessing a location of a wireless device, the wireless device having a first antenna and a second antenna, the method comprising:

25 i) transmitting a test signal from the first antenna;

ii) receiving direct and/or reflected components of the test signal through the second antenna;

iii) processing the direct and/or reflected components received through the second antenna to determine

at least one prescribed radio signal propagation characteristic;

iv) determining whether or not the wireless device is either inside or outside a building based on the  
5 determination of the at least one radio signal propagation characteristic.

16. The method of claim 15 further comprising:

v) selecting a first mode of operation upon determining that the wireless device is inside a building,  
10 and selecting a second mode of operation upon determining that the wireless device is outside a building.

17. The method according to claim 16, wherein upon failing to adequately determine whether or not the wireless device is inside or outside a building, a more restrictive  
15 one of the first and the second modes of operation is selected.

18. The wireless device of claim 15, wherein each of the at least one prescribed radio signal propagation characteristic is selected from a group consisting of delay  
20 spread, delay speed, delay distance, attenuation profile, amplitude slope, polarization, Doppler spread, and Doppler Speed.

19. A method of selecting at least one radio system operation parameter for a wireless device having first and  
25 second antennas, the method comprising:

i) transmitting a test signal from the first antenna;

ii) receiving direct and/or reflected components of the test signal at the second antenna; and

iii) automatically selecting at least one radio system operation parameter for the wireless device in accordance with a radio propagation characteristic derived from the direct and/or reflected components of the test  
5 signal received at the second antenna.

20. The selection of an indoor, outdoor or ambiguous location radio system operation parameter for a wireless device based on thresholds of at least two radio propagation characteristics of the environment surrounding the wireless  
10 device.

21. A wireless device adapted to automatically select a radio system operation parameter based on a self-determination of whether or not the wireless device is located indoors or outdoors, wherein the wireless device  
15 makes use of a selected set of pre-selected radio system operation parameters.

22. A method of automatically selecting a mode of operation for a wireless device, the wireless device having a first antenna and a second antenna, and wherein a  
20 particular mode of operation is selected from a plurality of modes of operation when the wireless device is located at a corresponding particular type of location, the method comprising:

i) transmitting a test signal from the first  
25 antenna;

ii) receiving one or more reflections of the test signal through the second antenna;

iii) processing the one or more reflections received through the second antenna to determine at least  
30 one radio signal propagation characteristic;

iv) determining what type of location the wireless device is located in based on the determination of the at least one radio signal propagation characteristic; and

5 v) selecting a mode of operation corresponding to the type of location that the wireless device is located in.

23. A wireless device comprising:

a first antenna and a second antenna; and

10 a system for automatically determining status of the antenna to differentiate between at least two status criteria.

24. The wireless device of claim 23, wherein the wireless device is a hybrid radio node, the first antenna is an access link antenna and the second antenna is a transit link antenna.

15 25. The wireless device of claim 24, wherein the at least two status criteria correspond to different radio system operation parameters.

20 26. The wireless device of claim 25, wherein the radio system operation parameters correspond, respectively, to an "indoor" and an "outdoor" setting.

27. The wireless device of claim 26, further comprising a test signal generator operable to transmit a test signal to at least one of said access or transit link radio antennas.

25 28. The wireless device of claim 27, further operable to select an appropriate one of the at least two status criteria in accordance with an assessment of predetermined criteria associated with the received test signal.

29. The wireless device of claim 27, wherein the test signal generator is operable to transmit the test signal from the access link antenna to the transit link antenna.

30. The wireless device of claim 28, wherein the 5 predetermined criteria includes at least one of the following attributes of said received test signal: delay spread, delay distance, attenuation profile, amplitude slope, polarization, and Doppler shift.

31. A method of selecting an appropriate mode of 10 operation for a wireless device having first and second antennas, the method comprising:

i) sending a test signal from the first antenna;

ii) receiving said test signal at said second antenna;

15                   iii) analyzing said received test signal with respect to at least one radio signal propagation characteristic; and

iv) selecting an appropriate mode of operation based on the at least one radio signal propagation 20 characteristic.

32. The method according to claim 31, further comprising a step of automatically selecting said appropriate mode of operation.

33. A method of automatically configuring a wireless 25 device having first and second antennas, the method comprising:

i) sending a test signal from the first antenna;

ii) receiving the test signal at said second antenna;

iii) configuring the wireless device in accordance with a characteristic of said received test signal.